

Building a Rice Decision Support System to Support Global Food Security and Commodity Markets, Phase II Project

SBIR/STTR Programs | Space Technology Mission Directorate (STMD)



ABSTRACT

Agriculture faces major challenges in the decades to come due to increasing resource pressures, severe weather and climate change, population growth and shifting diets, and economic development. Rice is one of the most important crops globally considering its role in the Earth system, food security, and providing livelihoods with more than 1 billion people depending on rice. Tools and systems that can help monitor production and support risk management are needed for decision making by many end users and governments. Futures are a tool used to manage or hedge risk, reduce volatility, improve food security, and maximize efficiency and profit on the open market. Currently, the rice futures market has little high quality and timely information available to make strategic or application specific decisions to reduce risk and maximize profit. The global rice futures market is thinly traded causing extreme price fluctuation orders of magnitude. The innovation of Rice Decision Support System (RiceDSS) is the seamless fusion of operational satellite remote sensing monitoring metrics of rice agriculture, rice yield modeling, and weather forecasts to generate near real time information on rice extent, growth stages, production forecasts and statistical uncertainty. RiceDSS uses a state-of-the-art open source framework with advanced automation routines, web-GIS, and mobile technologies to support visualization and delivery of information to support global food security programs and commodity markets.

ANTICIPATED BENEFITS

To NASA funded missions:

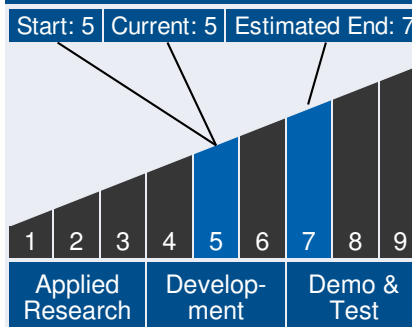
Potential NASA Commercial Applications: This effort will support futures market and NASA contribution to GEO-GLAM program, NASA Applied Sciences Program index insurance programs, and climate change science. RiceDSS will also support USDA NASS and RMA efforts providing area statistics, production estimates, and insurance for rice. Anticipated Direct Results: *



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Technology Maturity



Management Team

Program Executives:

- Joseph Grant
- Laguduva Kubendran

Program Manager:

- Carlos Torrez

Continued on following page.

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Platform for supporting rice futures markets * Operational, near real-time rice mapping products * Operational, near real-time rice yield forecasts with quantified uncertainties * Platform for supporting rice index insurance markets * Agricultural monitoring to support food security and risk management * Platform for Rice GHG MRV support.

To the commercial space industry:

Potential Non-NASA Commercial Applications: Better forecasts, more accurate and timely acreage information, planting progress, more accurate quality data prior to harvest, more accurate harvest date predictions, are a few key information needs of rice industry, including rice elevators and mills, rice breeders and overall supply chain. Environmental markets (e.g. California Rice Offset Protocol) needs access to spatially explicit, timely and accurate maps of rice production and management practices for efficient, cost effective and transparent offset markets. RiceDSS system, including the remote sensing linked with mobile apps and webGIS tools, can support environmental markets. This effort will support voluntary and compliance GHG offset markets using the existing and in development rice protocols for ACR, CAR and California ARB.

Management Team (cont.)

Project Manager:

- William Graham

Principal Investigator:

- William Salas

Technology Areas

Secondary Technology Area:

Modeling, Simulation, Information Technology and Processing (TA 11)

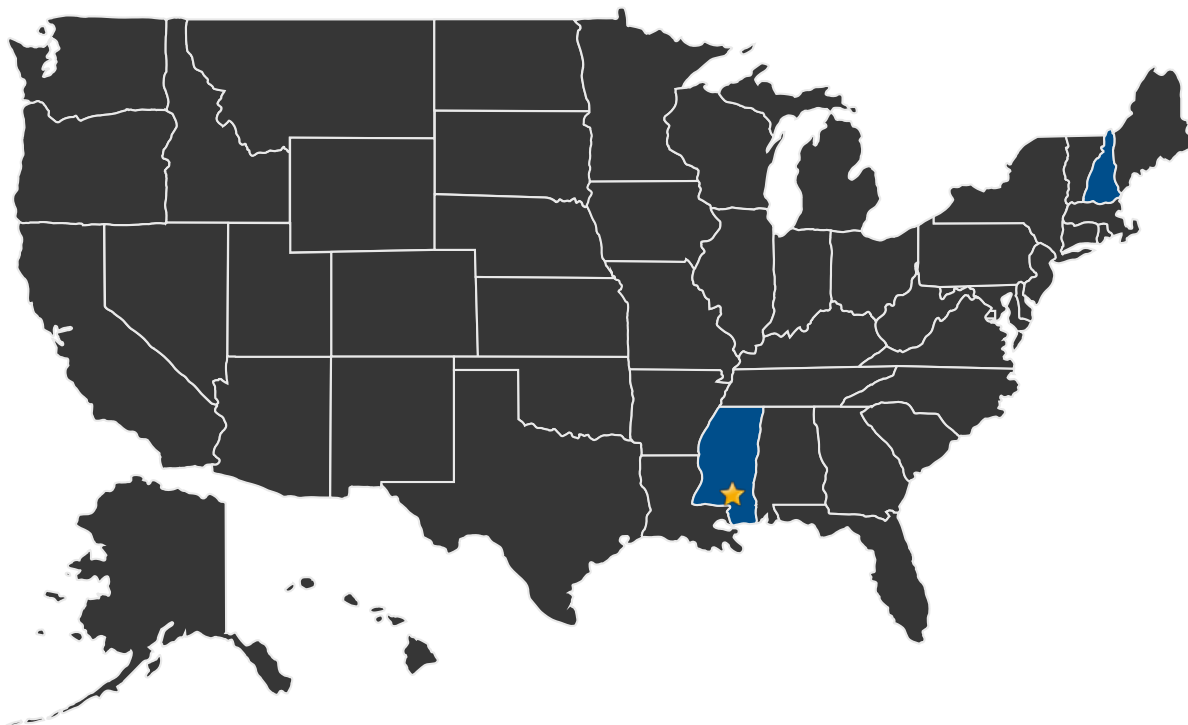
- └ Modeling (TA 11.2)
 - └ Science Modeling (TA 11.2.4)

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U.S. WORK LOCATIONS AND KEY PARTNERS



■ U.S. States With Work ★ **Lead Center:**
Stennis Space Center

Other Organizations Performing Work:

- Applied Geosolutions, LLC (Newmarket, NH)

PROJECT LIBRARY

Presentations

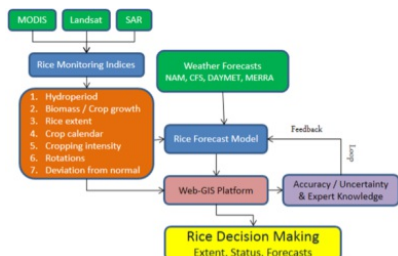
- Briefing Chart
 - (<http://techport.nasa.gov:80/file/23073>)

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IMAGE GALLERY



*Building a Rice Decision Support
System to Support Global Food
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DETAILS FOR TECHNOLOGY 1

Technology Title

Building a Rice Decision Support System to Support Global Food Security and Commodity Markets

Potential Applications

This effort will support futures market and NASA contribution to GEO-GLAM program, NASA Applied Sciences Program index insurance programs, and climate change science. RiceDSS will also support USDA NASS and RMA efforts providing area statistics, production estimates, and insurance for rice. Anticipated Direct Results: * Platform for supporting rice futures markets * Operational, near real-time rice mapping products * Operational, near real-time rice yield forecasts with quantified uncertainties * Platform for supporting rice index insurance markets * Agricultural monitoring to support food security and risk management * Platform for Rice GHG MRV support.